

## PATENT COOPERATION TREATY

PCT

NOTIFICATION OF THE RECORDING  
OF A CHANGE(PCT Rule 92bis.1 and  
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

David, G. ROSENBAUM, Esq.  
Rosenbaum & Associates, P.C.  
Suite # 3653  
875 North Michigan Avenue  
Chicago, Illinois 60611  
ETATS-UNIS D'AMERIQUE

Date of mailing (day/month/year) 01 August 2001 (01.08.01)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference BSI - 052	
International application No. PCT/US00/15565	International filing date (day/month/year) 05 June 2000 (05.06.00)

## 1. The following indications appeared on record concerning:

☐ the applicant      ☐ the inventor      ☒ the agent      ☐ the common representative

Name and Address ROSENBAUM, David, G. Rosenbaum & Associates, P.C. 514 Monroe Avenue P.O. Box 396 Glencoe, IL 60022 United States of America	State of Nationality	State of Residence
	Telephone No. 847-242-9986	
	Facsimile No. 847-835-1404	
	Teleprinter No.	

## 2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

☐ the person      ☐ the name      ☒ the address      ☐ the nationality      ☐ the residence

Name and Address David, G. ROSENBAUM, Esq. Rosenbaum & Associates, P.C. Suite # 3653 875 North Michigan Avenue Chicago, Illinois 60611 United States of America	State of Nationality	State of Residence
	Telephone No. 312-397-0303	
	Facsimile No.	
	Teleprinter No.	

## 3. Further observations, if necessary:

## 4. A copy of this notification has been sent to:

<input checked="" type="checkbox"/> the receiving Office	<input type="checkbox"/> the designated Offices concerned
<input type="checkbox"/> the International Searching Authority	<input checked="" type="checkbox"/> the elected Offices concerned
<input checked="" type="checkbox"/> the International Preliminary Examining Authority	<input type="checkbox"/> other:

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer P. BOCCARD (Fax 338.87.40) Telephone No.: (41-22) 338.83.38
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## PATENT COOPERATION TREATY

PCT

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner  
 US Department of Commerce  
 United States Patent and Trademark  
 Office, PCT  
 2011 South Clark Place Room  
 CP2/5C24  
 Arlington, VA 22202  
 ETATS-UNIS D'AMERIQUE  
 in its capacity as elected Office

Date of mailing (day/month/year) 03 April 2001 (03.04.01)	
International application No. PCT/US00/15565	Applicant's or agent's file reference BSI - 052
International filing date (day/month/year) 05 June 2000 (05.06.00)	Priority date (day/month/year) 04 June 1999 (04.06.99)
Applicant SAMMONS, David, W. et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

04 January 2001 (04.01.01)

☐ in a notice effecting later election filed with the International Bureau on:2. The election ☒ was☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Olivia TEFY Telephone No.: (41-22) 338.83.38
---	---

## PATENT COOPERATION TREATY

PCT

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner  
 US Department of Commerce  
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 2011 South Clark Place Room  
 CP2/5C24  
 Arlington, VA 22202  
 ETATS-UNIS D'AMERIQUE  
 in its capacity as elected Office

Date of mailing (day/month/year) 24 January 2002 (24.01.02)	
International application No. PCT/EP01/06302	Applicant's or agent's file reference S 4582 WO
International filing date (day/month/year) 01 June 2001 (01.06.01)	Priority date (day/month/year) 02 June 2000 (02.06.00)
Applicant NEIFER, Wolfgang	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

02 January 2002 (02.01.02)

☐ in a notice effecting later election filed with the International Bureau on:
2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Odile ALIU Telephone No.: (41-22) 338.83.38
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10/009085

JC10 Rec'd PCT/PTC  
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

04 DEC 2001

APPLICANT: Sammons, et al.

SERIAL NO.:

FILING DATE: Herewith

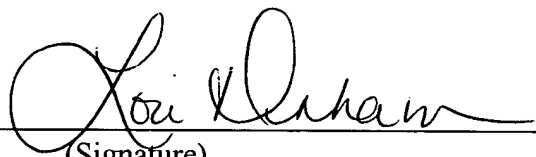
TITLE: SYSTEM AND METHOD OF PRENATAL DIAGNOSTIC SCREENING

U.S. Patent and Trademark Office  
BOX PCT  
P.O. Box 2327  
Arlington, VA 22202

**CERTIFICATE OF EXPRESS MAIL UNDER 37 CFR 1.10**

I hereby certify that the attached US NATIONAL STAGE TRANSMITTAL DOCUMENTS; COPY INTERNATIONAL SEARCH REPORT; COPY INTERNATIONAL PRELIMINARY EXAMINATION REPORT; INVENTORS' DECLARATION (UNSIGNED); ASSOCIATED FEES are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" Mailing Label No. EL 412 126 344 US on the date indicated below and is addressed to the U.S. Patent and Trademark Office, BOX PCT - FEES, P.O. Box 2327, Arlington, VA 22202.

\_\_\_\_\_  
Lori Dunham  
(Person Signing Certificate)

\_\_\_\_\_  
  
(Signature)

\_\_\_\_\_  
4 December 2001  
(Date of Signature)

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference BSI-052	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. PCT/US00/15565	International filing date ( <i>day/month/year</i> ) 05 JUNE 2000	(Earliest) Priority Date ( <i>day/month/year</i> ) 04 JUNE 1999
Applicant BIOSEPARATIONS, INC		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 5 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the report**

- a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).
- b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing:
  - ☐ contained in the international application in written form.
  - ☐ filed together with the international application in computer readable form.
  - ☐ furnished subsequently to this Authority in written form.
  - ☐ furnished subsequently to this Authority in computer readable form.
  - ☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
  - ☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (See Box II).

4. With regard to the title,

- ☒ the text is approved as submitted by the applicant.
- ☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

- ☐ the text is approved as submitted by the applicant.
- ☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No. 1

- ☒ as suggested by the applicant. ☐ None of the figures.
- ☐ because the applicant failed to suggest a figure.
- ☐ because this figure better characterizes the invention.

Box III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

## NEW ABSTRACT

A method prenatal diagnostic screening employing a system which integrates cell enrichment, labeling and detection steps. The labeling step characterizes cells using a combination of histochemical staining, antibody labeling and fluorescence in situ hybridization (FISH), and a method of detecting labeled cells using a computer imaging scanning system which detects labeled cells from immunohistochemical labeling and positionally compares the immunohistochemical labeled coordinates with a subsequently detected FISH label. See Figure 1.

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US00/15565

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :Please See Extra Sheet.

US CL :Please See Extra Sheet.

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. :

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

SCISEARCH, EMBASE, MEDLINE, BIOSIS

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
✓ Y	US 5,662,813 A (SAMMONS et al.) 02 September 1997. (02.09.1997). see entire document.	1-7
✓ Y	US 5,676,849 A (SAMMONS et al.) 14 October 1997 (14.10.1997). see entire document.	1-7
✓ Y,P	US 5,948,278 A (SAMMONS et al.) 07 September 1999 (07.09.1997) see entire document.	1-7
✓ Y,P	US 6,013,188 A (TERSTAPPEN et al.) 11 January 2000 (11.01.2000) see entire document.	1-7
✓ Y,P	US 6,008,010 A (GREENBURGER et al.) 28 December 1999 (28.12.1999) see col. 7-12, 17-28.	1, 8-10



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
*A* document defining the general state of the art which is not considered to be of particular relevance	*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
*E* earlier document published on or after the international filing date	*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
*L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*G* document member of the same patent family
*O* document referring to an oral disclosure, use, exhibition or other means	
*P* document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

28 AUGUST 2000

Date of mailing of the international search report

19 SEP 2000

Name and mailing address of the ISA/US  
Commissioner of Patents and Trademarks  
Box PCT  
Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

GAILENE R. GABEL

Telephone No. (703) 308-0196

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US00/15565

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
✓ Y	US 5,646,001 A (TERSTAPPEN et al.) 08 July 1997 (08.07.1997) see col. 16.	1-7
✓ A,P	US 5,861,253 A (ASGARI et al.) 19 January 1999 (19.01.1999) see entire document.	1-10
✓ Y	US 5,721,098 A (PINKEL et al.) 24 February 1998 (24.02.1998) see col. 23, 35-36.	1, 7-10



INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US00/15565

A. CLASSIFICATION OF SUBJECT MATTER:  
IPC (7):

G01N 27/26, 33/49, 33/53, 27/447; B01D 21/26, 35/06, 37/00; C12Q 1/68; C12N 1/00, 5/06; 5/08

A. CLASSIFICATION OF SUBJECT MATTER:  
US CL :

210/198.2, 209, 456, 660, 695, 745, 749, 767, 782, 787, 806; 204/450, 518, 543, 600, 627, 630; 435/2, 4, 5, 6, 7.2, 7.21, 7.32, 7.92, 240.2, 243, 249; 436/172, 174, 175, 177, 178, 526; 424/533, 720; 530/412, 413, 417, 427

## PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

REC'D 28 JUN 2001

WIPO

PCT

Applicant's or agent's file reference BSI - 052	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/US00/15565	International filing date (day/month/year) 05 June 2000 (05.06.2000)	Priority date (day/month/year) 04 June 1999 (04.06.1999)
International Patent Classification (IPC) or national classification and IPC  IPC(7): G01N 27/26, 33/49, 33/53, 27/447; B01D 21/26, 35/06, 37/00; C12Q 1/68.; C12N 1/00, 5/06, 5/08 and US Cl.: 210/198.2, 209, 456, 660, 605, 745, 749, 767, 782, 787, 806; 204/450, 518, 543, 600, 627, 630; 435/2, 4, 5, 6, 7.2, 7.21, 7.32, 7.92, 240.2, 243, 249; 436/172, 174, 175, 177, 178, 526; 424/533, 720; 530/412, 413, 417, 427		
Applicant BIOSEPARATIONS, INC		
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>3</u> sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of <u>2</u> sheets.</p>		
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the report</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of report with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>		
Date of submission of the demand 04 January 2001 (04.01.2001)	Date of completion of this report 29 May 2001 (29.05.2001)	
Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703)305-3230	Authorized officer Gailene R. Gabel <i>Gailene R. Gabel for</i> Telephone No. (703) 308-0196	

Form PCT/IPEA/409 (cover sheet)(July 1998)

**I. Basis of the report****1. With regard to the elements of the international application: \***

- ☒ the international application as originally filed.
- ☒ the description:  
pages 1-32 \_\_\_\_\_ as originally filed  
pages NONE \_\_\_\_\_, filed with the demand  
pages NONE \_\_\_\_\_, filed with the letter of \_\_\_\_\_.
- ☒ the claims:  
pages 33 and 34 \_\_\_\_\_, as originally filed  
pages NONE \_\_\_\_\_, as amended (together with any statement) under Article 19  
pages NONE \_\_\_\_\_, filed with the demand  
pages NONE \_\_\_\_\_, filed with the letter of \_\_\_\_\_.
- ☒ the drawings:  
pages 1-10 \_\_\_\_\_, as originally filed  
pages NONE \_\_\_\_\_, filed with the demand  
pages NONE \_\_\_\_\_, filed with the letter of \_\_\_\_\_.
- ☐ the sequence listing part of the description:  
pages NONE \_\_\_\_\_, as originally filed  
pages NONE \_\_\_\_\_, filed with the demand  
pages NONE \_\_\_\_\_, filed with the letter of \_\_\_\_\_.

**2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.**

These elements were available or furnished to this Authority in the following language \_\_\_\_\_ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

**3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:**

- ☐ contained in the international application in printed form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

**4. ☐ The amendments have resulted in the cancellation of:**

- ☐ the description, pages NONE
- ☐ the claims, Nos. NONE
- ☐ the drawings, sheets/fig NONE

**5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)). \*\***

\* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

\*\* Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

**V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. STATEMENT**

Novelty (N)	Claims <u>1-10</u>	YES
	Claims <u>NONE</u>	NO
Inventive Step (IS)	Claims <u>1-10</u>	YES
	Claims <u>NONE</u>	NO
Industrial Applicability (IA)	Claims <u>1-10</u>	YES
	Claims <u>NONE</u>	NO

**2. CITATIONS AND EXPLANATIONS**

Claims 1-10 meet the criteria set out in PCT Article 33(2)-(4), because the prior art currently of record does not teach or fairly suggest enriching and labeling a population of nucleated fetal erythrocytes and detecting the nucleated fetal erythrocytes by obtaining digitized images of fields containing the enriched, labeled erythrocytic cells and creating a plurality of coordinates positionally identifying the cells for processing and storing onto a web-based computer software.

Upon further consideration, Sammons et al. (US 5,662,813), Sammons et al. (US 5,676,849), Terstappen et al. (US 5,646,001), and Pinkel et al. (US 5,721,098) provide a teaching of the general state of the art.

Claims 1-10 have industrial applicability as defined by PCT Article 33(4) in the field of Obstetric Medicine and Neonatal Pathology.

----- NEW CITATIONS -----

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US00/15565**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(7) :Please See Extra Sheet.

US CL :Please See Extra Sheet.

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

U.S. :

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

SCISEARCH, EMBASE, MEDLINE, BIOSIS

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,662,813 A (SAMMONS et al.) 02 September 1997. (02.09.1997). see entire document.	1-7
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Y,P	US 6,008,010 A (GREENBURGER et al.) 28 December 1999 (28.12.1999) see col. 7-12, 17-28.	1, 8-10

☒ Further documents are listed in the continuation of Box C.
 ☐ See patent family annex.

* "A" "E" "L" "O" "P"	Special categories of cited documents: document defining the general state of the art which is not considered to be of particular relevance earlier document published on or after the international filing date document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) document referring to an oral disclosure, use, exhibition or other means document published prior to the international filing date but later than the priority date claimed	*T* "X" "Y" "A"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art document member of the same patent family
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Date of the actual completion of the international search

28 AUGUST 2000

Date of mailing of the international search report

Authorized officer

GAILENE R. GABEL

Telephone No. (703) 308-0196

Name and mailing address of the ISA/US  
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Box PCT  
Washington, D.C. 20231

Facsimile No. (703) 305-3230

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US00/15565

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INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US00/15565

A. CLASSIFICATION OF SUBJECT MATTER:  
IPC (7):

G01N 27/26, 33/49, 33/53, 27/447; B01D 21/26, 35/06, 37/00; C12Q 1/68; C12N 1/00, 5/06; 5/08

A. CLASSIFICATION OF SUBJECT MATTER:  
US CL :

210/198.2, 209, 456, 660, 695, 745, 749, 767, 782, 787, 806; 204/450, 518, 543, 600, 627, 630; 435/2, 4, 5, 6, 7.2, 7.21, 7.32, 7.92, 240.2, 243, 249; 436/172, 174, 175, 177, 178, 526; 424/533, 720; 530/412, 413, 417, 427